

**CLAIMS**

We claim:

1. A method for providing, in a service provider's network, a multicast capability for a customer packet of a virtual private LAN service, comprising:

5               at a provider edge device associated with the virtual private LAN service, encapsulating the customer packet of the virtual private LAN service in a service provider packet in accordance with a data communication protocol having a native multicast capability;

10              transmitting over the service provider's network the service provider packet using the native multicast capability of the data communication protocol from the provider edge device to a plurality of other provider edge devices associated with the virtual private LAN service; and

15              at each of the other provider edge devices associated with the virtual private LAN service, upon receiving the provider edge packet, recovering the customer packet.

2. The method as in Claim 1, wherein the data communication protocol having the native multicast capability comprises the Internet Protocol.

3. The method as in Claim 1, the encapsulating further comprising associating a unique identifier under the communication protocol with the virtual 20 private LAN service.

4. The method as in Claim 3, wherein the data communication protocol having the native multicast capability comprises the Internet Protocol, and the unique identifier comprises an Internet Protocol multicast group address.

5. The method as in Claim 4, wherein the Internet Protocol multicast group address associated with the virtual private LAN service is selected from a range set aside by the service provider for use with virtual private LAN services.

6. The method as in Claim 5, wherein the range set aside by the service provider is selected from a range having an administrative scope local to the service provider's network.

30              7. The method as in Claim 4, wherein the further distributing the Internet Protocol multicast group address using a name server.

8. The method as in Claim 1, wherein the transmitting is performed in accordance with a routing protocol for the multicast capability of the data communication protocol.

9. The method as in Claim 8, wherein the routing protocol comprises a  
5 source-based routing protocol.

10. The method as in Claim 8, wherein the routing protocol comprises a core-based routing protocol.

11. The method as in Claim 8, wherein the routing protocol creates a distribution tree for distributing the service provider packet for the virtual LAN  
10 service.

12. The method as in Claim 1, further comprising providing the virtual LAN service in the service provider's network using an Internet Protocol/Multi-protocol label switching service.

13. The method as in Claim 1, wherein the service provider provides the  
15 virtual private LAN service in the context of a Layer 2 virtual private network.

14. The method as in Claim 1, further comprising receiving the customer packet at the provider edge device originating from a customer edge device of a virtual LAN.

15. The method as in Claim 1, further comprising accepting into the  
20 service provider's network a packet that resembles the structure of the service provider packet for the virtual private LAN service only from the provider edge devices associated with the virtual private LAN service.

16. The method as in Claim 1, further comprising, at each of the other provider edge device, forwarding the customer packet to a customer edge device of a  
25 virtual LAN.

17. A system for providing a customer packet multicast capability in virtual private LAN service implemented on a service provider's network,  
comprising:

30 a first provider edge device associated with the virtual private LAN service adapted to encapsulate a customer packet of the virtual private LAN service in a service provider packet in accordance with a data communication protocol having a native multicast capability, the first provider edge device

including a transmitter for transmitting over the service provider's network the service provider packet using the native multicast capability of the data communication protocol; and

5           a second provider edge device associated with the virtual private LAN service, including a receiver for receiving the service provider packet from the service provider's network, the second provider edge device being adapted to recover the customer packet upon receiving the provider edge packet.

18.       The system as in Claim 17, wherein the data communication protocol having the native multicast capability comprises the Internet Protocol.

10       19.       The system as in Claim 17, wherein the first provider edge device includes in the service provider packet a unique identifier under the communication protocol with the virtual private LAN service.

15       20.       The system as in Claim 19, wherein the data communication protocol having the native multicast capability comprises the Internet Protocol, and the unique identifier comprises an Internet Protocol multicast group address.

21.       The system as in Claim 20, wherein the Internet Protocol multicast group address associated with the virtual private LAN service is selected from a range set aside by the service provider for use with virtual private LAN services.

22.       The system as in Claim 21, wherein the range set aside by the service provider is selected from a range having an administrative scope local to the service provider's network.

23.       The system, as in Claim 20, further comprising a name server for resolving the Internet Protocol multicast group address within the service provider's network.

25       24.       The system as in Claim 17, wherein the first and second provider edge devices implement a routing protocol for the multicast capability of the data communication protocol.

25.       The system as in Claim 24, wherein the routing protocol comprises a source-based routing protocol.

30       26.       The system as in Claim 24, wherein the routing protocol comprises a core-based routing protocol.

27. The system as in Claim 24, wherein the routing protocol creates a distribution tree for the virtual LAN service.

28. The system as in Claim 17, wherein the virtual LAN service in the service provider's network implements an Internet Protocol/Multi-protocol label switching service.  
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29. The system as in Claim 17, wherein the virtual LAN service implements a Layer 2 virtual private network.

30. The system as in Claim 17, wherein the first provider edge device comprises an interface to a customer edge device of a virtual LAN from which the  
10 customer packet is received.

31. The system as in Claim 17, further comprising an access control mechanism in the service provider's network that accepts a packet that resembles the structure of the service provider packet for the virtual private LAN service only from provider edge devices associated with the virtual private LAN service.

15 32. The system as in Claim 17, wherein the second provider edge device includes an interface to a customer edge device over which the second provider edge device forwards the customer packet.